

Service Manual

August, 1976,

FUN GAMES

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LUBRICATION

FOR MACHINE LUBRICATION, we recommend:

Valvoline X-All Multipurpose Grease
Part #564
Use periodically on all moving parts including springs.

FOR CLEANING PLEXIGLASS, we recommend:

Micro-Pel Cleanser, made by
Certified Labs
P.O. Box 2493
Ft. Worth, TX

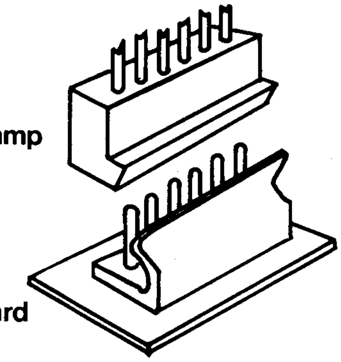
or

Meguiar's Mirror Glaze #MGH-17
Available in most auto supply stores.

GENERAL INSTRUCTIONS

INSTALLATION

Open back of cabinet and make sure the board is properly secured and all the connectors are seated properly.
All the connectors, J1, J2, and J4 should mate as shown.



5K STEERING POT ADJUSTMENT (FACTORY PRESET):

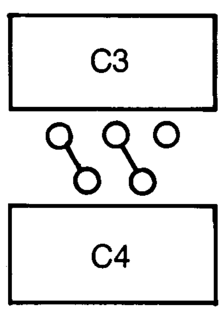
Measure voltage from I.C. location A-10 pin 14 to ground. Voltage will be approximately 11.5 volts. Adjust 5K pot so that the voltage measured from the cent terminal of pot to ground is exactly one half the previously measured voltage.

FOOT PEDAL:

Unpack foot pedal assembly found in the bottom of the cabinet. Connect the three pin molex connector, then bolt assembly using supplied wing nuts and washers.

PRICE PER GAME:

The board comes from the factory set for one coin per player. However, it can be changed to two coins per player by making the following changes:



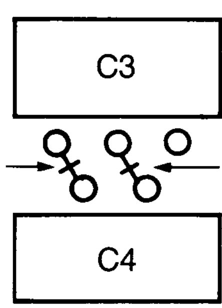
C3 — I.C. location C3

C4 — I.C. location C4

ONE COIN PER PLAYER

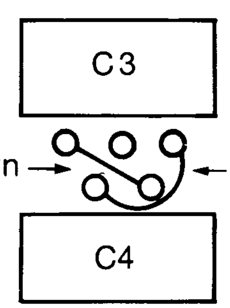
MODIFICATION:

TWO COINS PER PLAYER



Cut the traces (CKT side)

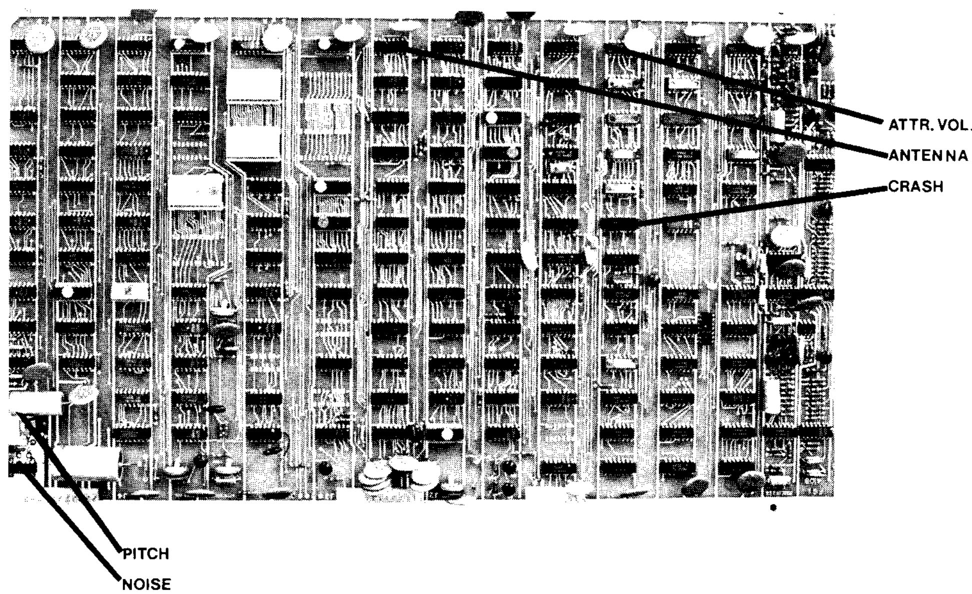
Put jumpers as shown



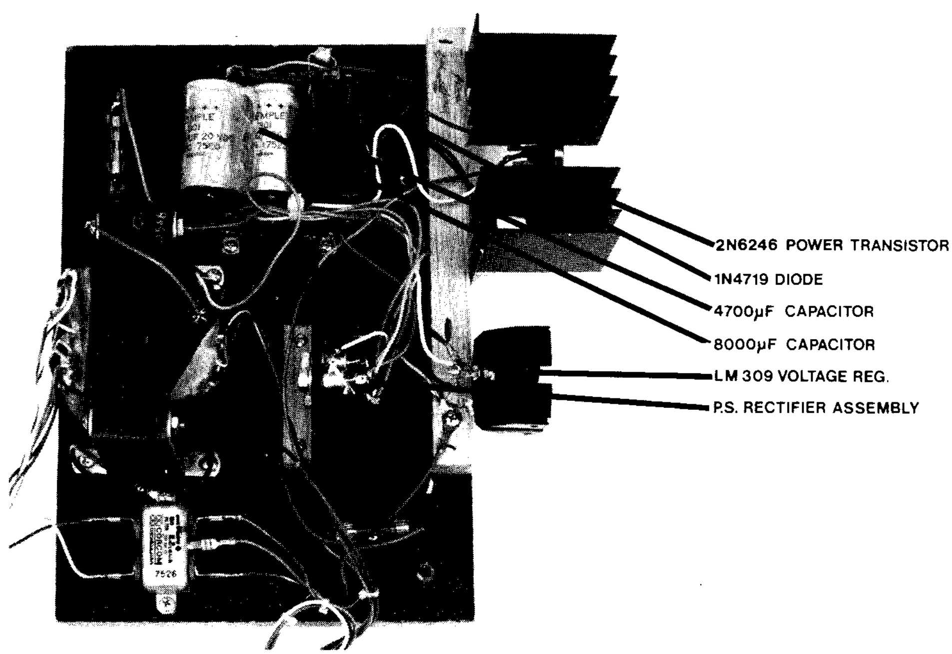
RACE

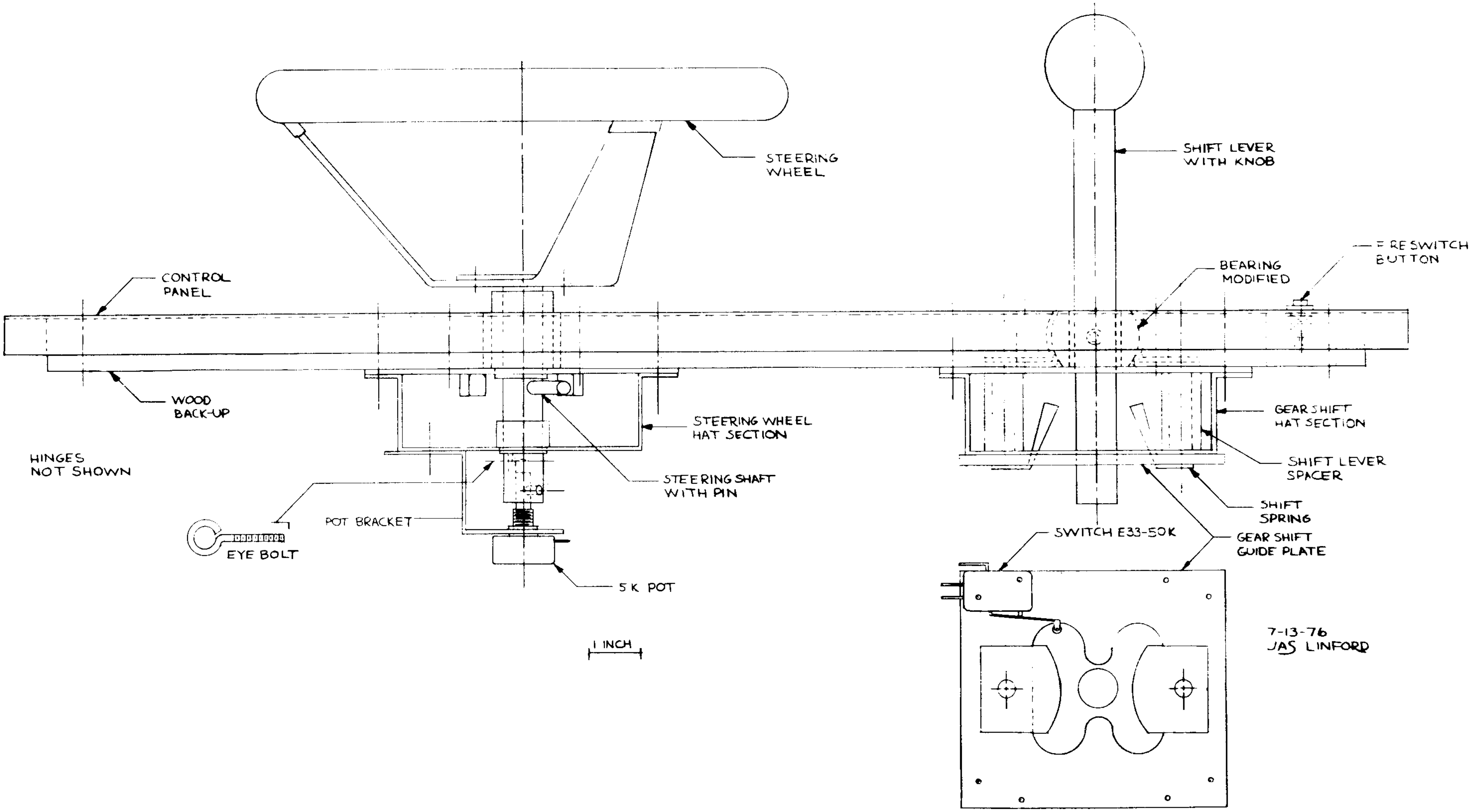


BOARD



POWER SUPPLY

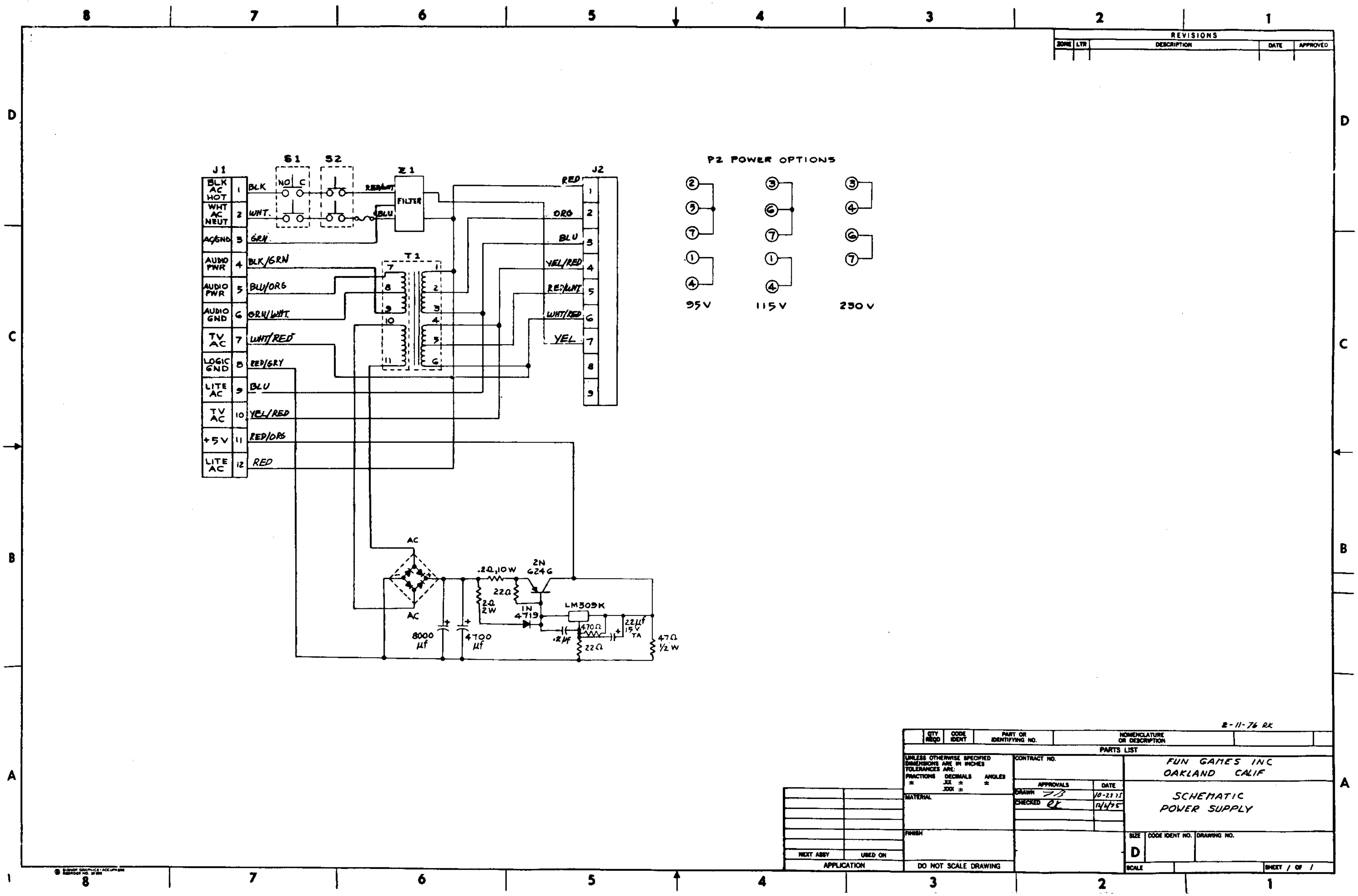




CONTROL PANEL SCHEMATIC DIAGRAM

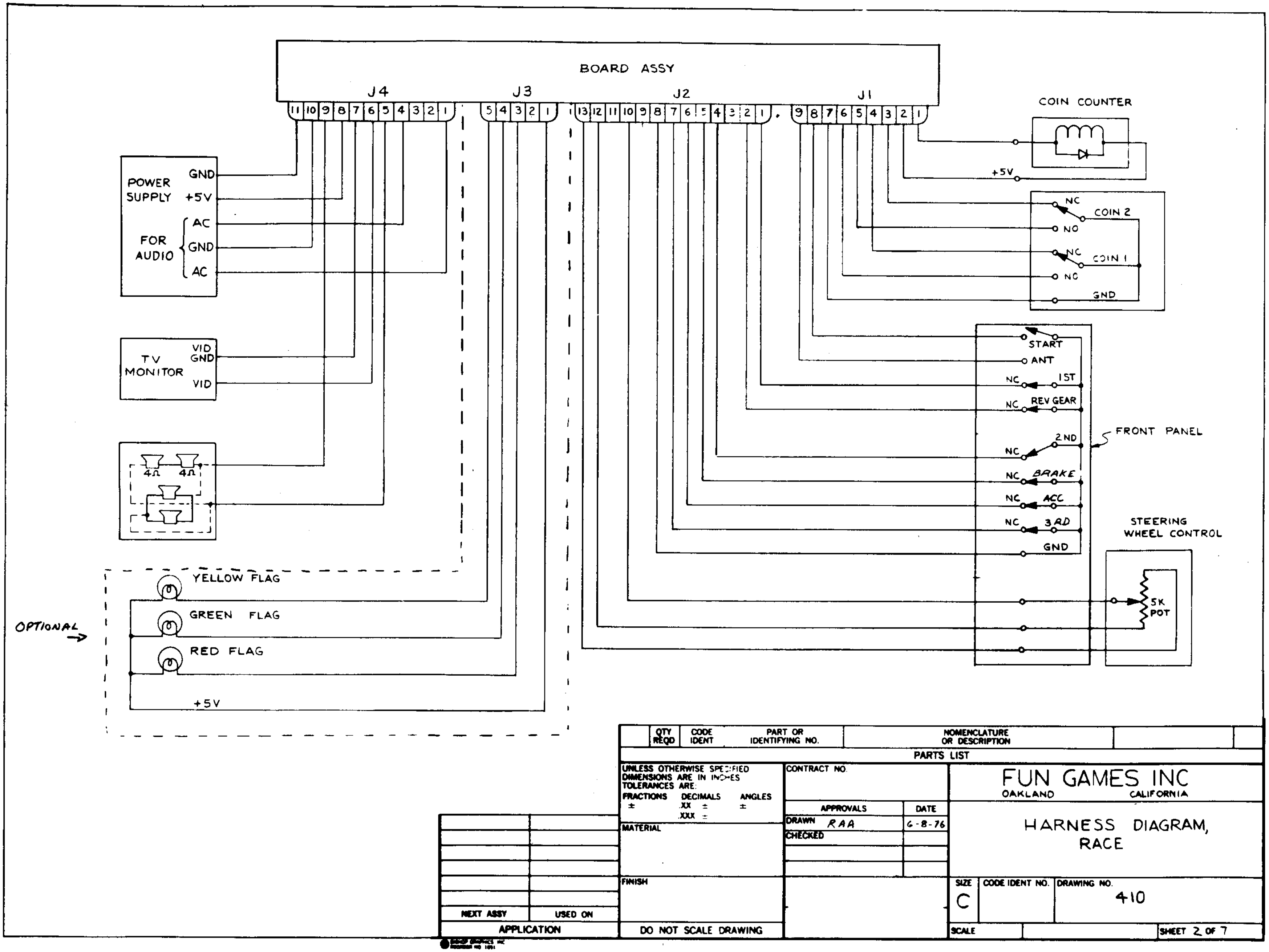
EXPLANATION OF TERMS AND ABBREVIATIONS

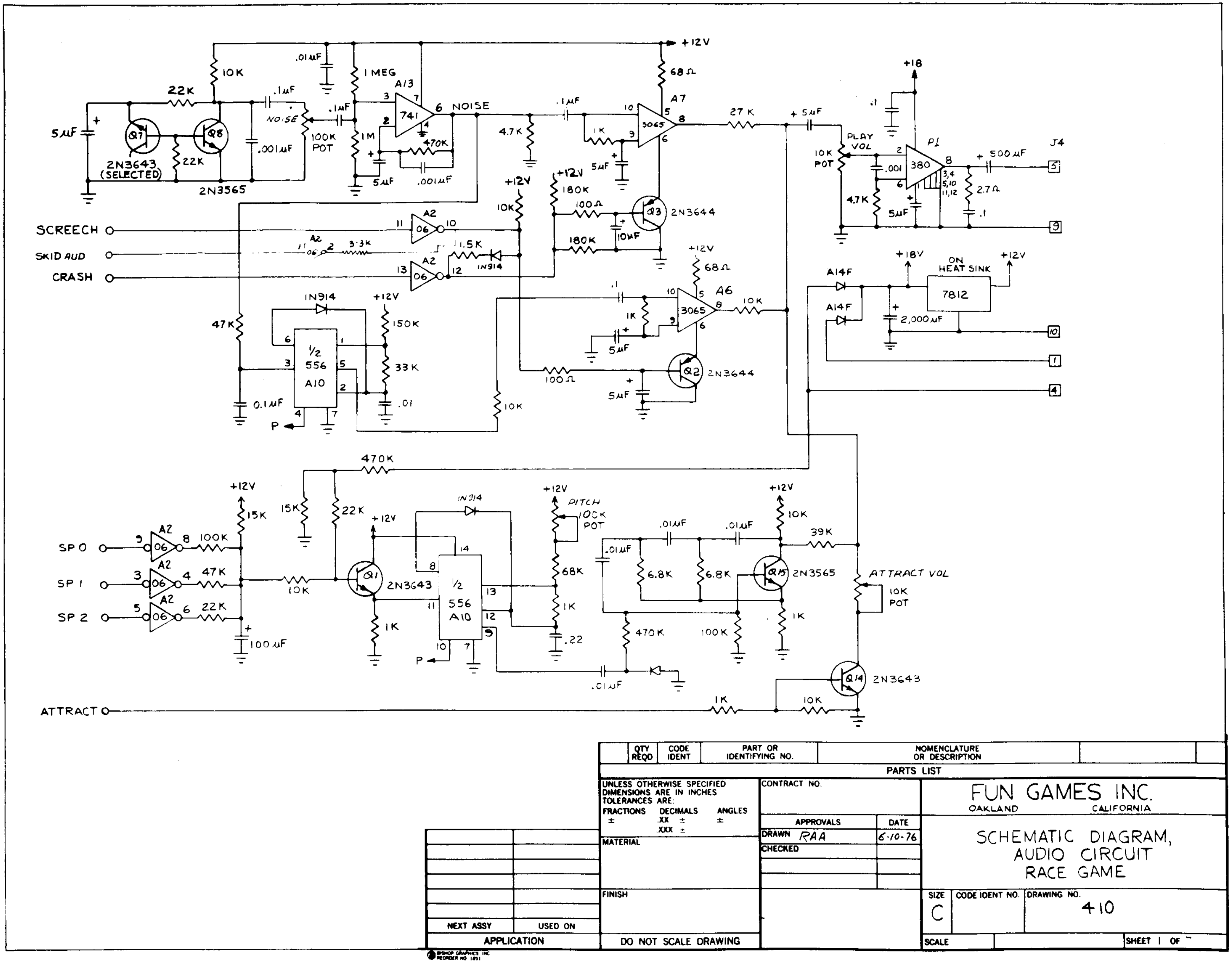
1. Ant. — Antenna.
2. Attract — Basic non-playing mode.
3. Attract Vol — Adjusts audio heard during attract mode.
4. C_1-C_{10} — Counter chain output designations.
5. Car — Positive video image of car.
6. Car Dir Cont Ckt — Car direction counting circuit. Represents signals and logic comprising counter network.
7. Car/message — Car or message signal.
8. CK_1-CK_2 — Split clock signals for added gate driving capacity.
9. Comp Win — Composite window. Comprises car, message, and score windows.
10. Crash — Signal generated when the car hits track or wreck. The car must pass through two track segments before crash signal can be generated.
11. Crash En — Crash Enable. Generated when car passes through 2 segments.
12. Dig — Game time digits.
13. Dir Sync — Synchronized direction data.
14. H Ctr preset — Horizontal counter preset. Together with V ctr preset, the signal calls out one distinct car picture from five pictures available in memory.
15. H rst — Horizontal reset.
16. H synch — Horizontal synch. Television synch pulse.
17. H synch B — Horizontal synch buffered.
18. M_0-M_7 — Motion codes.
19. Max/Min — Game time output.
20. Mes_0-Mes_2 — Binary code that calls out one of five available messages.
21. $Msel_{0,1}$ — Binary code, calls out one of four message windows
22. Rev Direction. Reverses horizontal and vertical motion counters
23. Screech — Signal generated by brake, downshift, crash and car travelling through an oil slick.
24. Seg Center — Center of segments making up video picture. The car passing through each seg center scores one point.
25. Skid — Signal that causes loss of steering control.
26. Suff Credit — Sufficient credit.
27. Underline — Video bar generated under player that is up **during playtime only**.



POWER SUPPLY SCHEMATIC DIAGRAM

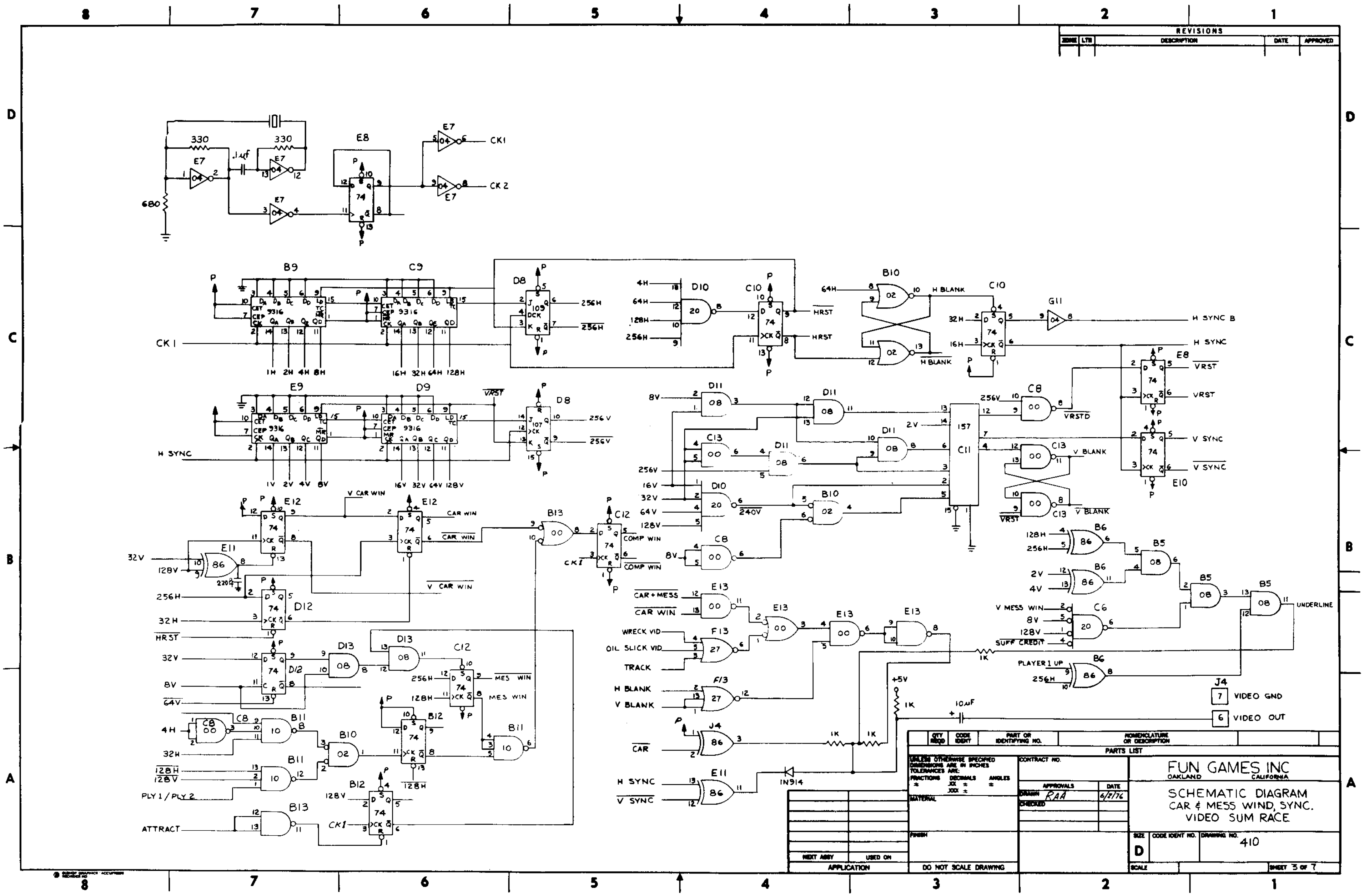
HARNESS SCHEMATIC DIAGRAM

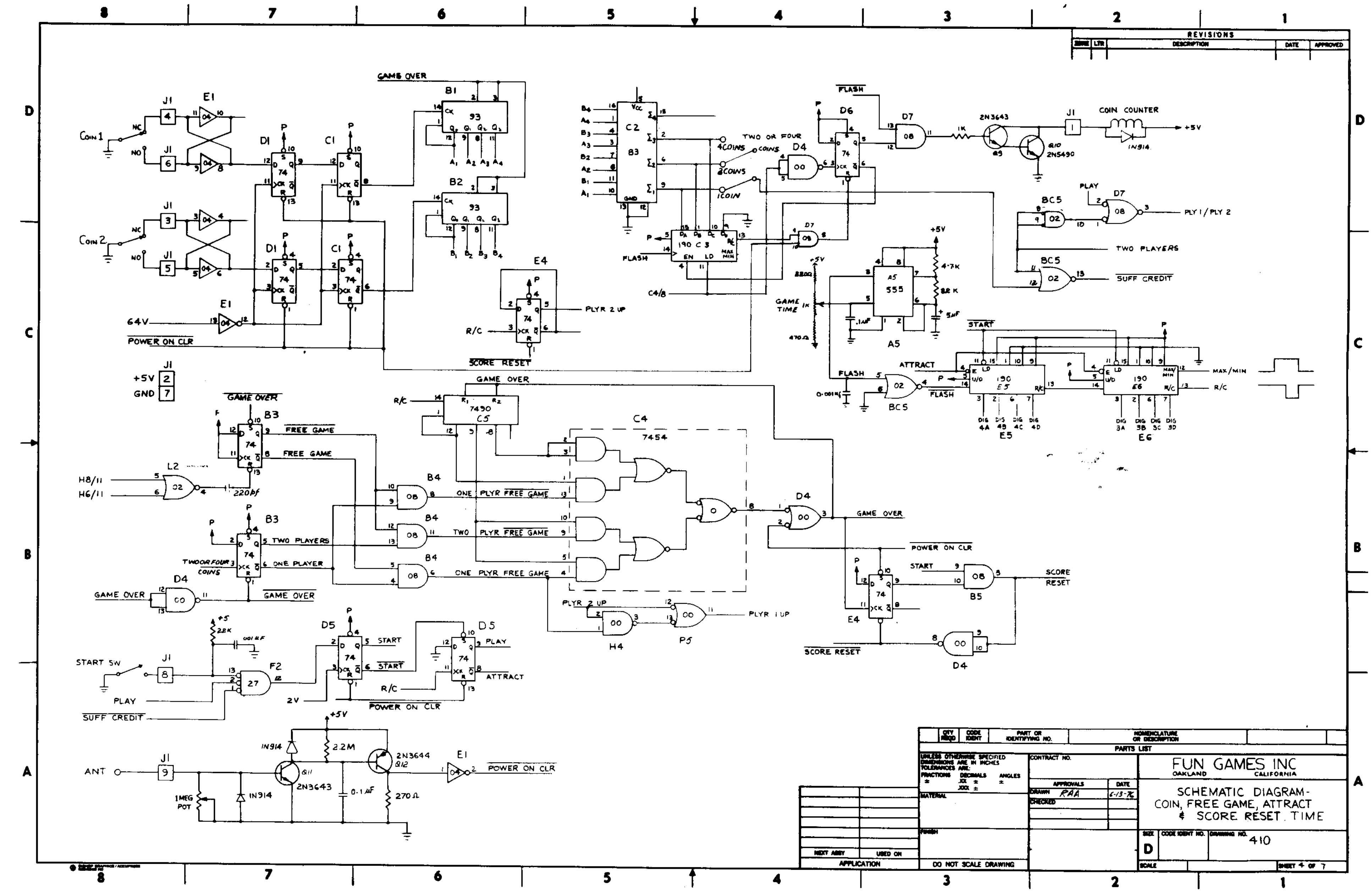




AUDIO CIRCUIT SCHEMATIC DIAGRAM

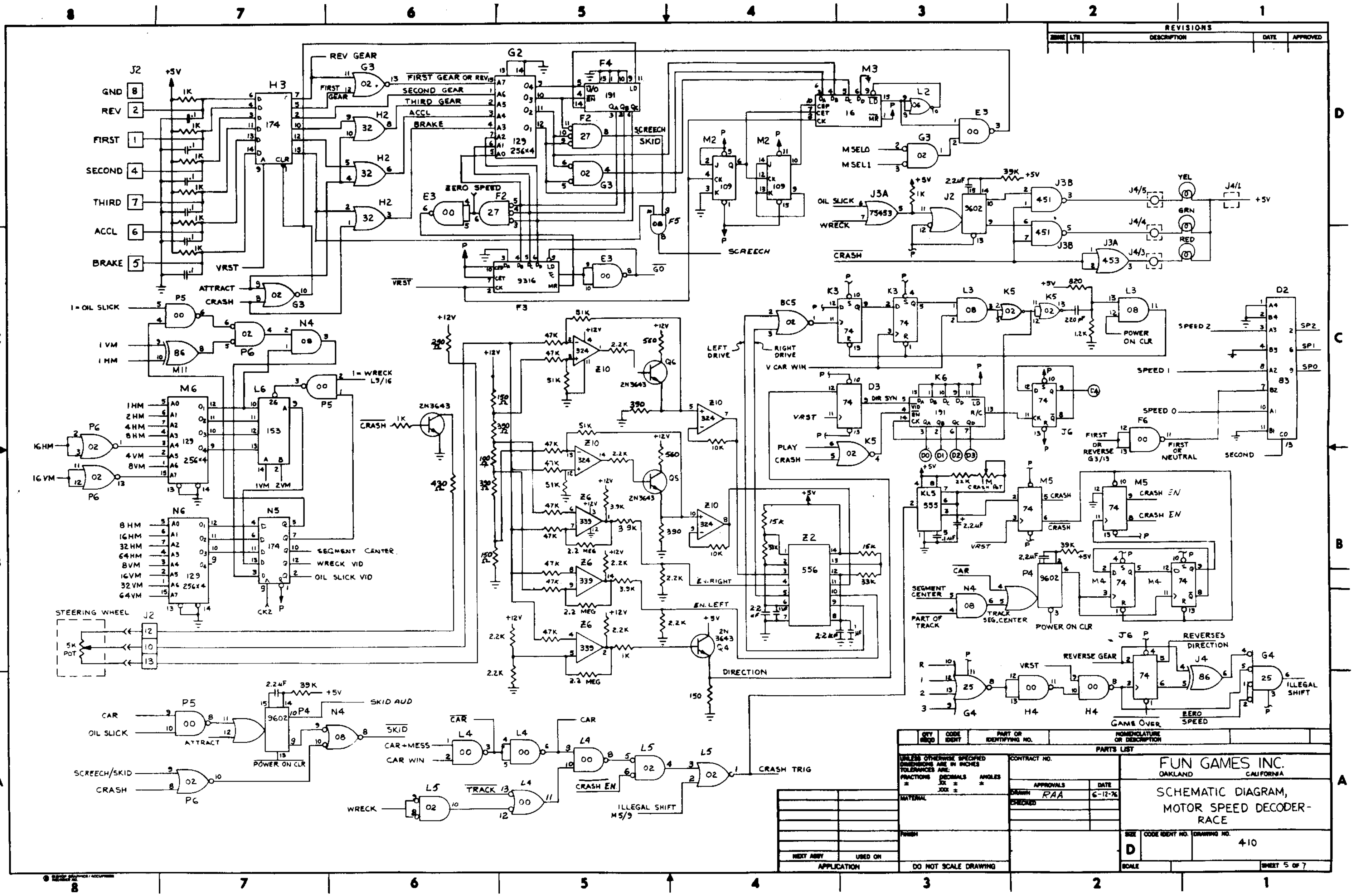
CAR AND MESS WIND, SYCN. VIDEO SCHEMATIC DIAGRAM

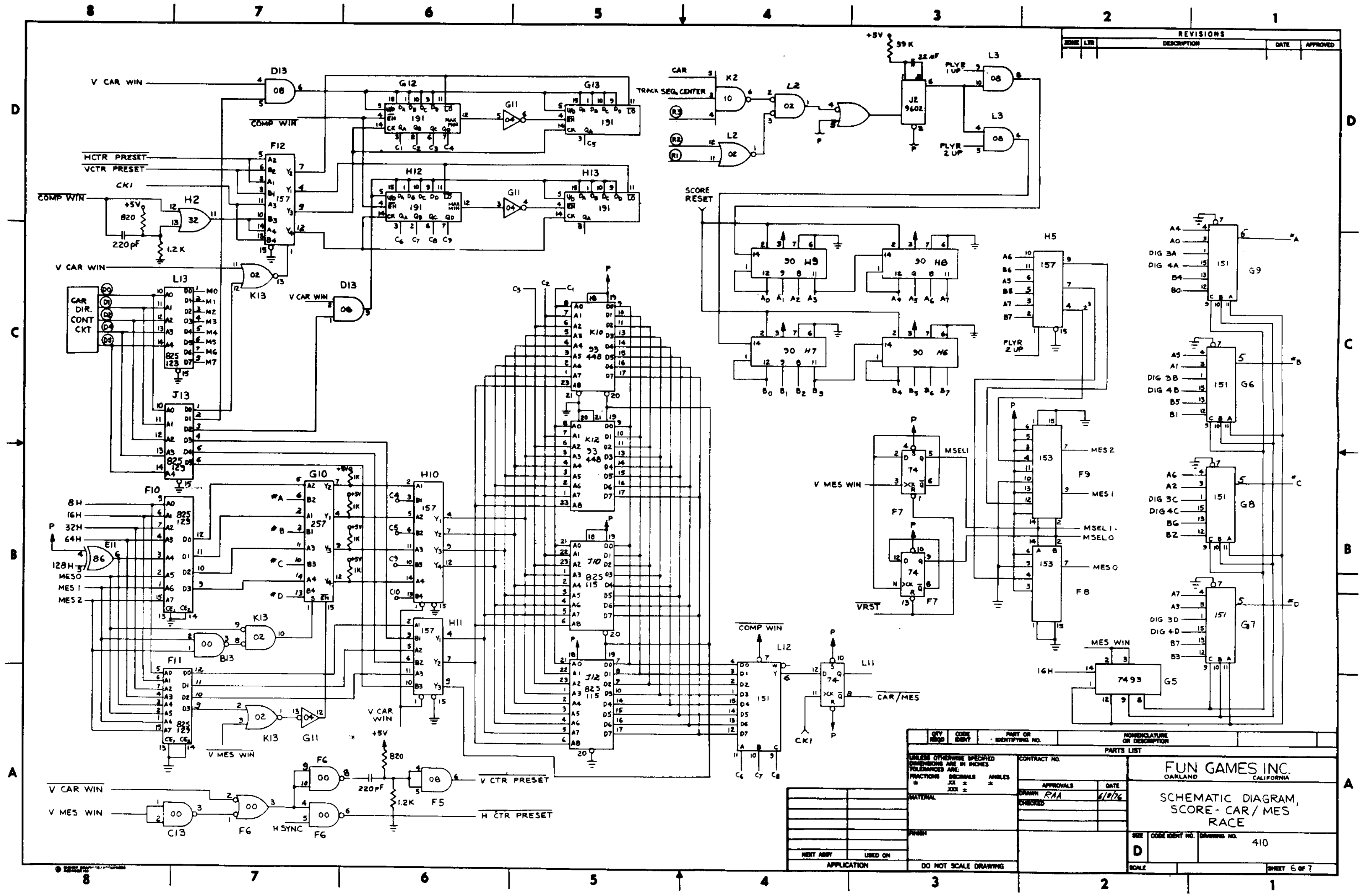




COIN, FREE GAME, ATTRACT AND SCORE RESET SCHEMATIC

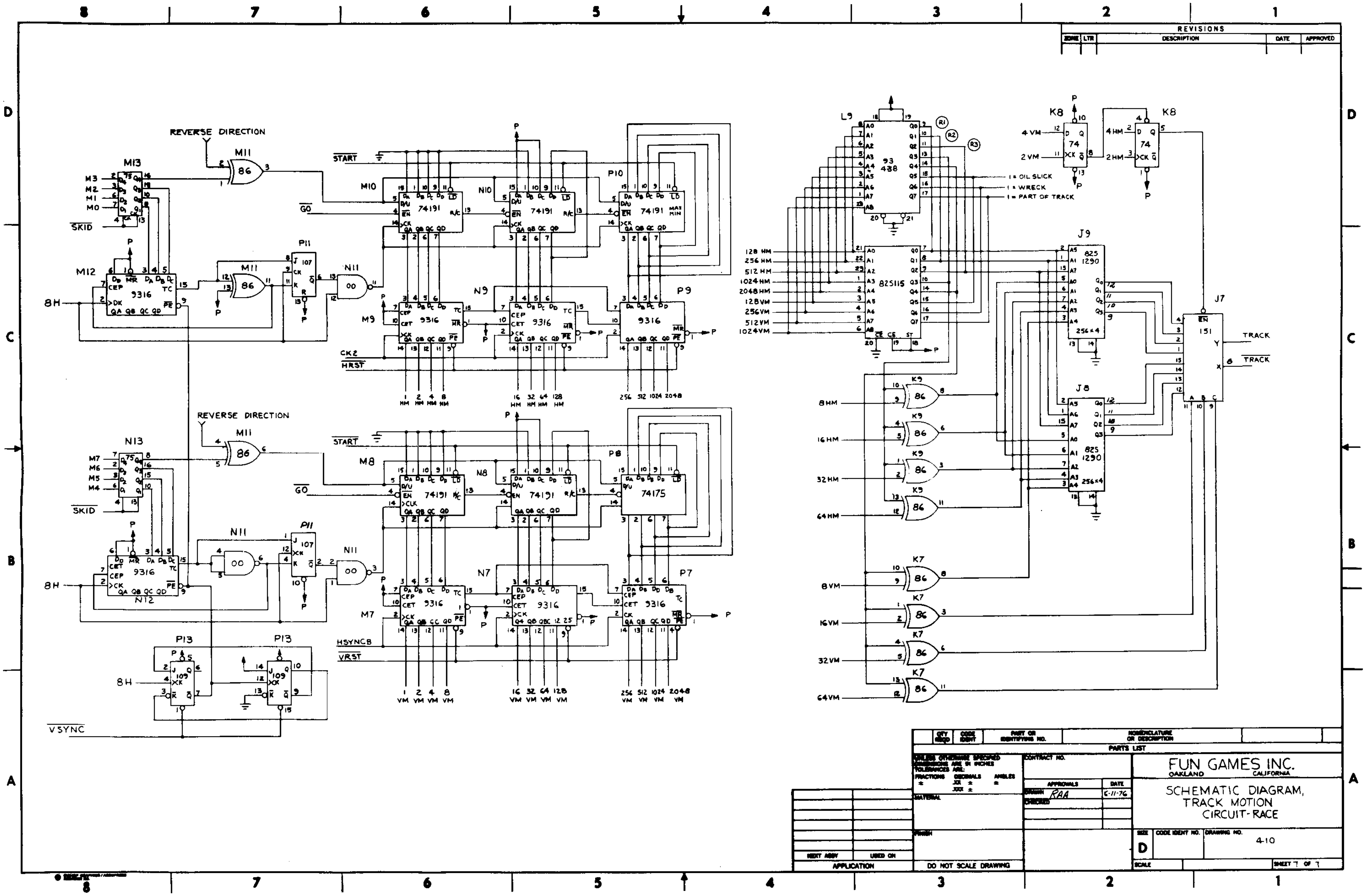
MOTOR SPEED DECODER-RACE SCHEMATIC DIAGRAM





SCORE-CAR/MESS RACE SCHEMATIC

TRACK MOTION CIRCUIT-RACE SCHEMATIC DIAGRAM



TEST POINTS

MEMORY

There are three 256 x 8 PROMS
1) J10 (k 10) has 4 car pictures
2) J12 (k 12) has 5th car picture and all the characters.
3) L7 (L9) has in the track patterns.

There are 7 (256 x 4) PROMS
A) J9 has the lower part of track segment.
B) J8 has the upper part of track segment.
C) M6 has wrecked car picture.
D) N6 determines the location for oil slicks, wrecked car and score segments.
E) G2 has speed code in it.
F) F10 and F11 have messages in them.

There are two 32 x 8 PROMS.
A) L13 has the motion code.
B) J13 is MULTIPLEXER MEMORY (Selects the car picture to be displayed.)

SCORE

Point is scored whenever car passes through a segment center located in the track.

CRASH

Before the car can crash again, it must pass through the segment center at least twice.
Car crashes whenever it is in coincidence with the track or the wrecked car.

THERE ARE SEVEN CONTROL POTS.
A) GAME TIME — Game time can be varied by this pot.
B) PITCH—This pot varies the pitch of motor audio. (Noise & pitch are factory preset — ONLY qualified personel should adjust.)
C) NOISE — This determines the noise level.
D) ANTENNA — Sensitivity of antenna can be varied with this.
E) PLAY VOL. — Determines the audio volume in play mode.
F) ATTR. VOL. — Determines the audio volume in attract mode.
G) CRASH — This controls the length of crash time.

TEST POINTS

SYNC

C10 Pin 8 should have approximately 63.5 u sec period pulse HRST.
E8 Pin should have approximately 16.3 m sec period pulse VRST.

WINDOWS

Use Video Probe

Car window 32V x 32H can be seen at E12 Pin 6 by using Video Probe.
Message window can be seen at C12 Pin 8 by Video Probe.
Comp window can be seen at C12 Pin 5.
Video sum is done at E13.

COIN CKT

Suff credit (active low) is at BC5 Pin 13.
Max/min originates at E6 Pin 12.
R/C originates at E6 Pin 13.
CREDIT in the game is shown by an underline, coin counter counts at the end of the game.

FREE GAME

A player can have free game if he scores 80 points or above. There are five comments given depending upon the score.

0 -19 .... LICENSE SUSPENDED
20 -39 .... BACK TO KIDDIE CARS
40 -59 .... TRIED DRIVING SCHOOL
60 -79 .... SLOW CARS KEEP RIGHT
80 -99 .... READY FOR PRO CIRCUIT

While the game is playing, play (D5 Pin 9) is high and attract (D5 Pin 8) is low.
If P5 Pin 11 is high player 1 is selected and if low player 2 is selected.

TEST POINTS

GAME OVER

Pulse is generated whenever the game ends, or on power on clear. Score reset pulse will be generated only when a fresh game is started.

SPEED CONTROL

Speed is controlled by PROM G2 which has its address generated by outside control.
E3 Pin 8 (GO) will control the speed depending on the number of pulses coming out.
GO signal will initiate the moving ckt and direction of count in vertical and horizontal motion ckt is determined by M11Pin 6 and M11 Pin 3 respectively.

STEERING CONTROL

On the steering control there is a 5K pot and voltage level at the wiper of this pot determines the direction in which the car will turn. When turning right Z2 Pin 4 should be high and the voltage level at Pin 3 of Z2 (variable) will determine the rate of turn. When turning left Z2 Pin 10 should be high and voltage level (variable) at Pin 11 of Z2 will determine the rate of turn.

MAX

Output frequency at BC5 Pin 1 should be approximately same for both directions, left and right turn.
The ratio of slowest to fastest turn rate should be about 1:4, when the car crashes it always turns right.

WARRANTY

Fun Games products are warranteed by Fun Games for a period of 180 days on the monitor, 90 days on P.C. boards and 30 days on all other components from the date of shipment against defects in material and workmanship under normal use and operation.

Fun Games sole and exclusive obligation is to replace or repair any item with any defect warranteed against it, provided Fun Games receives written notice of defect during the period of warranty, and any defective item or items of equipment are returned to Fun Games at purchaser's expense. All C.O.D. shipments will not be accepted. The expense of removal and reinstallation of any item is not included in this warranty.

Any replacement during the warranty period will be invoiced at our standard replacement price. This invoice will be due and payable within 30 days. If the defective part is returned to Fun Games within this 30 days, a credit will be allowed. If not returned to Fun Games in the 30 days, credit will not be allowed.

In no event will Fun Games be liable for any special, incidental, or consequential damages to purchaser or any third party caused by any defective item of equipment whether defect is warranteed against or not.

There are no warranties or guarantees, expressed or implied, other than those above.

Fun Games shall have no obligation to make repairs or replacements necessitated by catastrophe, fault or negligence of user.

FUN GAMES

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